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PROGRESS REPORT

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REPORT NO. 36 15 FEBRUARY 1954
FORT WORTH DIVISION

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PROJECT NO. MX-1602

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PROTOTYPE CONTRACT NO. AF-33(038)-19948
AND
PRODUCTION CONTRACT NO. AF-41(608)-6464
EXPENDITURE ORDER NO. R-409-31 SA4

REPORT NO. 36
15 FEBRUARY 1954
(COVERING PROTOTYPE AND
PRODUCTION PHASES)

CONFIDENTIAL
MX-1602

APPROVED BY

E. D. Mathis
PROJECT ENGINEER

5408 3700

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FOREWORD

This report has been prepared in two parts to present progress on: (1) prototype phases and (2) production phases of Project FICON.

Basically, this report covers accomplishments for the period from 15 January through 15 February 1954. In addition to a general summary of the current progress, an attempt has also been made to briefly summarize the status of the project as of the end of the previous report.

In view of the near completion status of the prototype portions of the FICON project and the beginning of production phases, only those groups or departments actively engaged in this program are reference with their specific progress for the current month. For summary of accomplishments by all groups and departments that have been affected by the prototype portion of this project, reference may be made to FICON Progress Report No. 21, dated 15 November 1952.



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PROTOTYPE STATUS



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Project No. MX-1602

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INTRODUCTION

The following section, which summarizes monthly progress for the FICON prototype project, is submitted to the Wright Air Development Center in accordance with Contract AF33(038)-19948.

The basic objective of the prototype program is the development of a composite RB-36 and F-84 type airplane to incorporate an in-flight launching and retrieving mechanism for the F-84 in order to provide long range, high speed reconnaissance and bombing capabilities. This program, the greater portion of which is complete, consists of the following work:

- a. Phase I - Exploratory flight tests of an F-84E and an YF-84 in proximity to an RB-36.
- b. Phase II - Development, design, construction and flight test of a minimum prototype composite airplane consisting of an RB-36 and an F-84E airplane.
- c. Phase III - Design prototype bomb bay doors for fairing around the RF-84F airplane and make engineering studies of a production tactical composite airplane.
- d. Additional 25-Hour Flight Test Program - To further evaluate the FICON system prior to flight testing of the YF-85F under Phase IV. WADC authorized an additional 25 hours of flight time for flight testing of the RB-36/F-84E combination after completion of Phase II flight tests.
- e. APG Operational Suitability Tests - USAF Headquarters directed the APG Command to perform Operational Suitability Tests on the RB-36/F-84E combination after completion of Convair's flight test evaluation of the subject combination.



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- f. Phase IV - Incorporate parasite provisions into a YF-84F airplane and modify the existing prototype RB-36 launching and retrieving mechanism for use with the YF-84F airplane and conduct flight tests.
- g. Fifty-hour (50) Extended Phase IV Flight Test Program - Authorization to proceed with a 50-hour extended flight test program of the RB-36/YF-84F combination has been received. Initial flights were scheduled to begin 22 September 1953 to indoctrinate additional fighter pilots into the FICON parasite operations. Also, these flights will permit further research and testing to assist in final development of a tactical production parasite system.



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STATUS AS OF PREVIOUS REPORT
(Dated 15 January 1954)

General Summarization

Exploratory flight tests required under Phase I of the Contract, and the development and flight test evaluation of the RB-36/F-84E required under Phase II have been completed. The final flight under Phase II was accomplished on 29 May 1952. For complete information concerning these phases, refer to Report No. 15, dated May 1952.

Phase III design and study work on the RB-36 provisions for a production version has been completed. Design study work on the YF-84F for a production tactical parasite, which was accomplished by Republic Aviation Corporation under subcontract to Convair, has also been completed.

The additional 25 hours of flight testing of the RB-36/F-84E combination as authorized by WADC was completed on 12 September 1952. This additional testing served to further explore certain phases of parasite operations in advance of the swept wing fighter program and to test improvements made in the launching and retrieving mechanism. A new test probe and receiver arrangement of the "V" type was also flight tested during this program and proved to be a definite aid to single-point contact. This dictated the



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design of a permanent probe and receiver arrangement of the "V" type which was installed on the RB-36/F-84E.

Acceptance and delivery of the FICON airplanes was made to Carswell Air Force Base on 6 October 1952 where APG performed the first two flights for testing "Operation Suitability". Upon completion of the APG operational suitability tests at Eglin Air Force Base, the FICON RB-36 No. 143 and the F-84E parasite were returned to this installation on Friday, 6 March 1953.

Delivery of the YF-84F airplane was made to Edwards Air Force Base on 15 March 1953 for 10 hours of low-stability flight evaluation. Following completion of this evaluation, the YF-84F parasite fighter was delivered to Convair, Fort Worth facility, on 18 April 1953. The first five flight tests of the RB-36/YF-84F combination were conducted between 18 May and 12 June 1953.

Flights 64 and 65, accomplished on 23 July 1953, completed all Phase IV flight testing. Thus, all Convair Phase IV work was completed, with all basic parasite provisions having been incorporated in the airplane. Phase III drawings and layouts were reviewed and unresolved problems were evaluated. Detailed work, job and time estimates, plus a list of design decisions required were prepared in anticipation of production go-ahead.

Upon receipt of authorization of a 50-Hour Extended Flight



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Program for the RB-36/YF-84F combination, flights were scheduled for and started on 22 September 1953. This program is to run concurrently with the initial phase of production design and fabrication in order to assist in securing a tactical production parasite system at the earliest possible time.

Final agreement on the FICON production contract was reached and a Sales Order was issued allowing complete go-ahead for all departments to start modification of ten (10) RB-36D's to the FICON configuration.

The first and second flights under the 50-hour extended flight test program were accomplished on 22 and 23 September 1953. On 2 October 1953, the YF-84F was flown to Edwards Air Force Base for high-speed taxi tests, which were conducted with the trapeze yoke attached to the parasite as one phase of the jettisoning tests. After a satisfactory completion of these tests, the YF-84F was returned to Fort Worth. Flight No. 3 was accomplished on 9 October 1953 for an operational check of the YF-84F nose-probe emergency release system and an evaluation of high-altitude pilot transfer equipment. As a result of these first three flights, conducted under the 50-hour extended flight test program, improvements were made in the latch of the trapeze retrieve yoke and in the transfer equipment. In addition, strain gages were calibrated,



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instrumentation and interphone contacts were reworked, and provisions for night lighting were incorporated on the carrier airplane.

The RB-36D/YF-84F combination accomplished the fourth flight under the 50-hour extended flight test program on Thursday, 22 October 1953. Closing speed tests, structural evaluation of trapeze, and some single-point jettison tests were accomplished on this flight. Flights 5 and 6 were accomplished on 6 November 1953. The fifth flight was for the purpose of evaluating high-altitude crew transfer, YF-84F closing speed tests, high-speed retrieving tests, and jettison operation. The sixth flight was made at night for evaluation of the lighting provisions installed for night operations. Flight No. 7 was accomplished on 13 November 1953 for the purpose of evaluating a drogue and cable arrangement for possible use as an emergency or alternate system and for checking the RB-36 camera compartment escape hatch provisions when the trapeze is in the extended position. This flight was the last to be accomplished prior to the lay-up period for major inspection.

These seven flights, which were conducted under the 50-hour extended flight test program, have consumed a total of 14 hours. The remaining time will be utilized after the major inspection of



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the RB-36D and YF-84F and the installation of other items (i.e. production-type boom latches and rendezvous equipment) have been accomplished. The remaining 36 hours of flight time will be used for further jettison and flight testing with pylon tanks installed on the YF-84F. Lay-up for the major inspection will delay this testing approximately three months.

Only a small amount of work was accomplished on the RB-36/YF-84F airplanes during the 15 November - 15 December reporting period since they were laid up for major inspection.

FICON prototype airplane No. 143 began major inspection during the month of January as authorized by Sales Order 882F-55, issued 30 December 1953. Scheduling called for completion of one-hundred hours inspection and installation of new items for flight testing to be accomplished during January and February 1954. Following this work, flight testing of the RB-36/YF-84F combination was scheduled to be resumed on 19 February 1954.

Contracts

Contract AF 33(038)-19948 with Convair and Contract No. FW-19948-CSC(1) with Republic Aviation Corporation, as a subcontractor, have been definitized.



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In Convair letter 19948 FW#11-426, dated 16 March 1953, the Contractor submitted a proposal for the modification 60 RB-36 and 200 RF-84F airplanes to the basic FICON configuration as established under Contract AF 33(038)-19948.

Amendment No. 3 to Letter Contract AF 41(608)-6464 was received on 10 August 1953 authorizing modification of ten (10) RB-36D's to the FICON configuration under the SAM-SAC program. However, Amendment No. 3 was not executed because of numerous exceptions outlined in Convair letter 6464 FW#231 dated 7 August 1953.

On 17 August 1953, Contractor received CCN No. 10 to Contract AF 33(038)-19948 authorizing 50 hours additional flight testing of the RB-36/YF-84F aircraft combination.

On 28 August 1953, the Contractor received authorization by Amendment No. 3 to Letter Contract AF 41(608)-6464 to proceed with the modification of ten (10) RB-36D airplanes to the FICON configuration under the SAM-SAC program with the first airplane scheduled for delivery to the Air Force in September 1954.

The final cost estimate for the FICON extended flight test program was submitted to AMC by Convair letter 19948 FW#11-521 dated 20 November 1953.

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Major inspection of the FICON airplane was authorized by
CCN No. 12, Master Serial No. N-96356, on 30 December 1953.

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CURRENT PROGRESS

General Summarization

Flight testing of the RB-36/YF-84F prototype combination will be started again during the first of March 1954. It is anticipated that a one-month delay in the completion of the flight test program will result due to the sequence in which the items of design were prepared. This sequence caused the design of installations for the tests to be prepared last.

The test request for performing a sleeve de-icing test of the F-84 leading edge while in flight has been released. This is to determine the feasibility of removing a F-84 leading edge sleeve from a station in the bomb bay of the RB-36. Meanwhile, ice removal tests on a leading edge section are being conducted in the laboratory.

Contracts

No significant contractual developments occurred during this reporting period.



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P A R T I I

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PRODUCTION STATUS



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Project No. MX-1602

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INTRODUCTION

The following section is a summary of monthly progress for FICON production, which is to be accomplished under the SAM-SAC program in accordance with Amendment No. 3 to Letter Contract AF 41(608)-6464.

Convair's FICON production program calls for the modification of ten (10) RB-36D airplanes. Although the present contract is for the modification of only ten (10) RB-36D's, tooling will be prepared for 60 or more. The work to be accomplished under this program consists essentially of providing:

- a. Trapeze
- b. Doors and fairing
- c. Associated equipment for operation of trapeze and doors
- d. Crew provisions for operation of parasite provisions
- e. Provisions for refueling the RF-84F parasite when stowed aboard the RB-36D
- f. Heating of RF-84F camera equipment and cockpit
- g. Installation of rendezvous equipment
- h. Accomplish twenty-five (25) hours of flight testing of the RB-36D/RF-84F combination.

The last of the modified RB-36D's is scheduled for delivery to the Air Force by January 1955.

Modification of 26 RF-84F's will be accomplished by Republic Aviation Corporation with the engineering and tooling sub-contracted to Beech Aircraft Corporation.



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STATUS AS OF PREVIOUS REPORT
(Dated 15 January 1954)

General Summarization

ENGINEERING - All preliminary design drawings were submitted to WADC for approval.

On 23 September 1953, a conference was held at Wright-Patterson Air Force Base between WADC, AMC, SAAMA, Republic Aviation Corporation, and Convair personnel on the production FICON program. At this conference, assignments of responsibility within AMC and WADC organizations at Wright-Patterson Air Force Base were clarified.

Convair and Republic representatives attended a meeting held on 14 October 1953 at Wright-Patterson Air Force Base, at which the FICON provisions were presented as agreed upon by WADC to SAC. Convair was requested to install the APX-29 rendezvous equipment in the RB-36D carriers in lieu of the APN-12A which is presently installed. The ability to furnish this new system was placed under consideration as to cost, schedule, and method of handling.

A change in the location of the RF-84F when in the loading and cruise position within the bomb bay of the RB-36 was made due to a change in the RF-84F canopy lines. This change can be accomplished with little design work. An engineering and tooling re-



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view of the production RB-36D FICON doors, as originally proposed, has resulted in the decision to utilize a sandwich-type construction.

A meeting at Beech Aircraft Corporation was held on Tuesday, 10 November 1953, for the purpose of coordinating the design of the RF-84F parasite provisions. Beech is sub-contractor for Republic on this work.

A meeting was held at Beech Aircraft Corporation on 16 November 1953 to review with WADC the design features of the RF-84F parasite installations.

Final agreement was reached with Republic Aviation Corporation on the location of the provisions for refueling the RF-84F when stowed aboard the B-36 and the location of the camera heating provisions for the RF-84F. Review of interphone provisions on the nose probe of the RF-84F and the RB-36 boom receiver was made on 8 December 1953 at a meeting held at Beech Aircraft Corporation.

Design work on bomb bay fairing doors, aft bomb bay fairing, forward bomb bay fairings, and bomb bay transition doors were completed and the drawings were released for fabrication.

It was decided to change the design of the bomb bay fuel tank from the bladder type to a welded metal construction. Study



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revealed that this type of tank should cost less, eliminate the procurement of bladder cells from outside vendors, and provide a lighter and simpler tank which can be entirely fabricated at this facility.

A design decision has been reached to allow the aft fixed fairing between bulkhead 8 and 9 to remain with the RB-36 when the airplane is reconverted to a standard RB-36 configuration. It was found that weight-wise and drag-wise there would be no penalty.

The Furnishings, Electro-Mechanical, and Fuselage groups essentially completed their design work.

The snubber-jack on the forward end of the boom was relocated outboard to align itself with the center line of the boom. This change was occasioned by a need for greater boom down-angle for retrieve to give adequate RF-84F approach clearance.

The problem of opening the RF-84 camera doors when the RF-84F was in the cruise position within the RB-36 was resolved by rotating the RB-36 trapeze boom up to an angle such that the parasite doors no longer interfered with the RB-36 doors. This change required very little additional provisions in the RB-36.

MANUFACTURING (Fabrication, Tooling, Installation, and Materials) - Engineering releases, tool planning, design, and manufacturing were started. Fabrication has been delayed, pending approval of drawings by WADC.



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From the review of the production RB-36D FICON doors, it was decided to utilize a sandwich construction. It appears that this change will provide a better production door at less cost and will at the same time give members of the shop and tooling valuable experience in handling this type of construction.

RB-36D (No. 120) was received at this facility on 10 December 1953. This was the first of the ten RB-36D airplanes to be modified by Convair.

Approximately 350 drawings were released. From these approximately 1200 detail tools and 300 tool assemblies were completed.

Airplane No. 120 was washed down and put thru the DIR (Disassembly, Inspection, and Repair) cycle. Although the airplane underwent the normal SAM-SAC cycle, it was also prepared (tearing out, alteration, etc.) for installation of the FICON provisions.

Contracts

Authorization for the modification of ten (10) RB-36D's to the FICON configuration was received on 10 August 1953 under amendment 3 to Letter Contract AF 41(608)-6464. However, this amendment was not executed because of numerous exceptions contained in Convair letter 6464 FW#231 dated 7 August 1953. A sat-



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isfactory authorization was received on 28 August 1953 by Amendment 3 to Letter Contract AF 41(608)-6464 for modifying ten (10) RB-36D's under the SAM-SAC program.

Formal approval, to install the AN/APX-29 rendezvous equipment in FICON production Airplanes, was requested via Letter 6464 FW#11-793 dated 31 December 1953.



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CURRENT PROGRESS

General Summarization

ENGINEERING - Production engineering will be completed by the last of February 1954. This amounts to approximately two weeks delay in release of all engineering. The delay in resolving all design coordination problems with Republic Aviation Corporation and a re-design of the boom aft latch support structure are the primary causes for this delay.

Information received from Republic Aviation Corporation indicates greater electrical load requirements for the RF-84F when stowed aboard the RB-36. This requirement imposes additional electrical design problems for Convair. Attempts are being made to clarify this situation.

All the major fuselage work items have been completed. Remaining fuselage work consists of minor revisions and corrections and shop follow-up.

"Standard Aircraft Characteristics," report FZA-36-307 and substantiating report FZA-36-308 were published during the month of January 1954. A review of these reports was made at a meeting held 11-15 January 1954 (at Convair, Fort Worth facility) with WADC Standard Aircraft Characteristics personnel. At WADC's request, several minor revisions were made.



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Final release of all power plant design drawings was accomplished 12 February 1954.

A Utility Flight Handbook is currently being prepared. The expected completion date is June 1954.

Specification FPS-0002, covering the use of adhesives on FICON doors, is nearly complete. However, information relating to allowable bonding pressure on core material which will not cause crushing of the cells is being determined. An investigation is also being made to determine whether the Metlbond 2021 primer may be cured at 250°F for one hour without necessitating higher pressure requirements, to agree with the cure requirements for FM-47 primer. This would permit all parts of the FICON doors to receive one drying cycle only.

MANUFACTURING (Fabrication, Tooling, Installation and Materials) -

The first contract for FICON seals was let to Kirkhill Rubber Company. Quoted prices were below expectation. Delivery is anticipated in five weeks.

To date approximately 527 drawings have been released. From these, approximately 1500 detail tools and 400 tool assemblies have been completed. Detail parts are being fabricated.

Contracts

No significant contractual developments occurred during this reporting period.

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2 SEP 2009

Defense Technical Information Center
Attn: Ms. Kelly Akers (DTIC-R)
8725 John J. Kingman Rd, Suite 0944
Ft Belvoir VA 22060-6218

Dear Ms. Akers,

This concerns the following Technical Reports:

AD030368, Project FICON, 28 February 1966 (FOIA#2009-03050FJM)

AD00052997, Description of Parasite System utilizing Covair, 16 July 1958 (FOIA# 2009-03049FJM)

AD0162502, Project TOM TOM, 16 July 1958 (FOIA#2009-03046FJM)

All of these reports have previous Distribution Limitation: 02- DoD and their contractors.

Subsequent to WPAFB FOIA Control Numbers 2009-03050-FJM, 2009-03049FJM and 2009-03046FJM these records have been cleared for public release by Air Force Research Lab Materials and Manufacturing Senior Scientist and Deputy Chief on 25 August 2009. Therefore, record is now fully releasable to the public. I ask that it be available online for public view so that the requestor may obtain the records as needed.

Please let my point of contact know when the record is available to the public.
Email: jodi.mccoy@wpafb.af.mil, if you have any questions, my point of contact is Jodi McCoy at (937) 522-3095.

Sincerely,

KAREN M. COOK
Freedom of Information Act Manager
Base Information Management Section
Knowledge Operations

8 Attachments

1. FOIA Request # 2009-03046FJM
2. Copy of AFMC Form 559
3. FOIA Request # 2009-03050FJM
4. Copy of AFMC Form 559
5. FOIA Request # 2009-03050FJM
6. Copy of AFMC Form 559
7. FOIA Request # 2009-03049FJM
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